Abstract

Glass coatings on metals including Ti, Ti6A14V and CrCo were prepared for use as implants. The composition of the glasses was tailored to match the thermal expansion of the substrate metal. By controlling the firing atmosphere, time, and temperature, it was possible to control the reactivity between the glass and the alloy and to fabricate coatings (25- 150 μm thick) with excellent adhesion to the substrate. The optimum firing temperatures ranged between 800 and 840°C at times up to 1 min in air or 15 min in N_2. The same basic technique was used to create multilayered coatings with concentration gradients of hydroxyapatite (HA) particles and SiO_2.